Review Article

Impact of Early Adenotonsillectomy on Quality-of-Life Improvement in Children with Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis

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ABSTRACT

Obstructive sleep apnea syndrome (OSAS) in children is a prevalent pediatric illness, marked by partial or complete upper airway obstruction during sleep that significantly impacts quality of life. Adenotonsillectomy is the initial surgical treatment for kids with adenotonsillar hypertrophy. Nonetheless, AT's comparative effectiveness versus other therapies in terms of QoL improvement is contentious. This study systematically compares the effects of AT vs. WWST on QoL, cognition, and behavior in pediatric OSAS patients. A PRISMA-compliant systematic review and meta-analysis were conducted. The search was conducted across PubMed, Web of Science, Ovid Medline, Google Scholar, and ClinicalTrials.gov, encompassing studies published between 2000 and 2024. Studies were included if they reported QoL outcomes in pediatric OSAS patients comparing AT with WWST. Risk of bias was assessed using ROB 2 for randomized controlled trials (RCTs), and statistical analyses were performed using RevMan. Four RCTs (N=1436) met the inclusion criteria. AT significantly improved QoL, as measured by OSA-18 (pooled mean difference: -14.16[-25.40, -2.93]; $P < 0.00001$, $I^2 = 79\%$) and PedsQL (pooled mean difference: 4.92 [3.37, 6.47]; $P < 0.00001$, $I^2 = 0\%$). However, AT did not significantly improve cognitive and executive functions (BRIEF mean difference: -2.44 [-18.32, 13.44], $P = 0.05$, $I^2 = 77\%$). Risk of bias showed variability in blinding and attrition rates. AT greatly enhances QoL in children with OSAS compared to WWST, while its effect on cognition and executive function remains uncertain. Long-term outcomes and cost-effectiveness should be addressed by future studies to inform clinical decision-making.

Keyword: Adenotonsillectomy, obstructive sleep apnea, quality of life, systematic review, meta-analysis.

Introduction

Sleep is an essential biological function that supports physical growth, cognitive development, and overall health, especially in children. When sleep is disturbed, it can greatly affect a child's behavior, well-being, and quality of life (QoL).

Pediatric obstructive sleep apnea (OSA) is a common disorder marked by recurring episodes of partial or total upper airway obstruction during sleep. These episodes often lead to hypercarbia or decreased oxyhemoglobin saturation.

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Nighttime manifestations typically consist of snoring, paradoxical thoracoabdominal motion, chest retractions, apneic episodes, respiratory difficulty, cyanosis, and disturbed sleep. Daytime symptoms may be presented as nasal congestion. Pediatric OSA most commonly affects children aged 2–8 years, when the tonsils and adenoids are relatively large compared to the airway size. Risk factors for developing OSA at an early age include premature birth, Down syndrome, African American ethnicity, and frequent upper respiratory infections, such as those associated with daycare attendance [1]. The prevalence of sleep-disordered breathing (SDB) in children varies by severity, ranging from approximately 8–27% for primary snoring to 1–5% for OSA [1-3]. The prevalence increases further in children with associated conditions, such as Down syndrome and other disorders that affect airway anatomy or muscle tone. Its prevalence is increasing alongside the rising trend of childhood obesity [2]. Management of pediatric OSA involves both surgical and non-surgical approaches. The surgical option, primarily adenotonsillectomy (AT), remains the gold standard treatment for cases associated with adenoid and tonsillar hypertrophy. In selected patients, especially younger children with craniofacial abnormalities, surgical correction of craniofacial anomalies may also be indicated. Non-surgical management includes pharmacologic therapy, orthodontic and myofunctional interventions, and positive airway pressure (PAP) therapy. However, the effectiveness and indications for non-surgical treatments remain subjects of ongoing debate within the medical community [4]. Despite the documented benefits of AT, the necessity of surgery for all children with OSA has been questioned, especially for those presenting with mild symptoms. Alternative treatment options for OSA include supportive care measures, such as intranasal corticosteroids or continuous positive airway pressure (CPAP) [1,5]. In children with mild to moderate OSA, the Childhood Adenotonsillectomy Trial (CHAT) compared early AT with a watchful waiting approach. The study found that while AT led to greater improvements in symptom severity and behavior, both early AT and watchful waiting groups showed significant quality of life improvements after seven months [5]. Nevertheless, the extent to which AT or watchful waiting with supportive care improves QoL—based on validated instruments such as the Pediatric Quality of Life Inventory (PedsQL) and the Obstructive Sleep Apnea-18 (OSA-18)—remains debated. Numerous known criteria have been used to evaluate OSAS-quality life relationships. In cases of OSA, the OSA-18 questionnaire is the most used tool for assessing QoL. Physical pain, emotional distress, sleep disturbance, daytime problems, and caregiver concerns are the five areas into which the 18-question survey is divided. Each domain is given a score between 1 and 7, with higher values denoting a lower QoL. An OSA-18 total score below 60 indicates a minimal impact on health-related quality of life (QoL), scores between 60 and 80 suggest a moderate impact, and scores above 80 reflect a significant effect on QoL [6]. Given these findings, a systematic evaluation of the literature is warranted to compare the effectiveness of AT and supportive care in improving QoL among children with OSA. This review aims to evaluate the effectiveness of early adenotonsillectomy compared with watchful waiting accompanied by supportive care (WWSC) in enhancing QoL in children with OSAS. Furthermore, this review includes a meta-analysis to quantify the pooled effect size of QoL improvement and explore potential sources of heterogeneity, such as OSA severity, patient age, and the QoL assessment tools used

Methods

This review compares the effects of adenotonsillectomy versus watchful waiting with supportive care on quality-of-life improvement in children with obstructive sleep apnea We adhered to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines [7] to minimize selection bias in the included studies. Additionally, the study protocol was registered with PROSPERO prior to December 2024; the registration ID is (ID: CRD42025636350). We performed a systematic search across the following databases: PubMed, Web of Science, Ovid Midline, Google Scholar, and Clinical trials.gov, for articles published between 2000 and 2024. The search strategy employed the terms: (“adenotonsillectomy” OR “tonsillectomy” OR “adenoidectomy”) AND (“obstructive sleep apnea” OR “pediatric sleep-disordered breathing”) AND (“quality of life” OR “QoL” OR “health-related quality of life”). Studies were selected for review according to PICO (population, intervention, comparison, outcome) criteria.

Study Selection: English published studies only are selected in this systematic review, the studies must meet the following criteria if they concern in Pediatric patients (<18 years) who are diagnosed with OSA, Studies comparing adenotonsillectomy with watchful waiting with supportive care, reporting QoL outcomes using validated tools, Such (OSA 18) and (PedsQl) scales, and as Randomized controlled trials (RCTs) or observational studies. Studies failing to meet the eligibility criteria were excluded from this systematic review. Studies focusing on adults or non-OSA populations, Case series or case reports, conference abstracts, or reviews without primary data, and Studies not reporting QoL as an outcome, or if the study was not published in English.

Screening and data extraction: Duplicate records were first identified and removed using the (Rayyan. Ai) tool, followed by independent and simultaneous screening of titles and abstracts by two reviewers. The full texts of the selected articles were independently and simultaneously reviewed by two additional reviewers, with any disagreements resolved through consultation with a third reviewer. Data extraction was conducted by two reviewers for the following variables: study characteristics (authors, year, design, and sample size); population details (age, OSA severity, and comorbidities); interventions (adenotonsillectomy) and comparison group (watchful waiting with supportive treatment); follow-up duration; quality-of-life outcomes (baseline mean scores, changes, and standard deviations); apnea–hypopnea index (AHI); and adverse event. Any disagreements during data extraction or screening were resolved by consensus between two independent reviewers, and all retrieved data were double-checked to ensure accuracy and avoid duplication.

Quality assessment and bias risk: The risk of bias for each included study was evaluated using a tool appropriate to its design. For randomized controlled trials (RCTs), the Cochrane Risk of Bias tool (RoB 2) was employed [8]. Six domains were assessed: selection bias, performance bias, detection bias, attrition bias, reporting bias, and other potential biases. Two reviewers independently evaluated the risk of bias for each study, resolving any disagreements through discussion. The overall risk of bias for each study was categorized as high, low, or unclear based on individual domains' evaluation. For assessing the quality and bias risk in non-randomized studies, including cohort and case-control designs, the Newcastle-Ottawa Scale (NOS) was applied. As there are no cohort studies included the NOS for bias assessment was not applicable.

Statistical Analysis: Data was analyzed using Cochrane RevMan software, and heterogeneity among included articles was evaluated using the p-value test. Funnel plot for publication bias and heterogeneity. When $p \geq 0.1$ and $I^2 \leq 50\%$, heterogeneity was not considered statistically significant, and a fixed-effects model was applied. Statistically significant heterogeneity was considered present when $p < 0.1$ and $I^2 > 50\%$. In such cases, a random-effects model used, and sources of the heterogeneity were further examined through subgroup analyses. As mean differences in OSA 18 and PedsQl scales mean difference are continuous Variables, the improvement of quality of life will be expressed by mean difference (MD). A 95% confidence interval (CI) is used to express all interval estimates. When P value < .05 it indicates statistical significance. The data of mean differences effects is demonstrated in Forest plot diagrams.

Results

Study Selection: Data was analyzed using Cochrane RevMan software, and heterogeneity among included articles was evaluated using the p-value test. Funnel plot for publication bias and heterogeneity. When $p \geq 0.1$ and $I^2 \leq 50\%$, heterogeneity was not considered statistically significant, and a fixed-effects model was applied. Statistically significant heterogeneity was considered present when $p < 0.1$ and $I^2 > 50\%$. In such cases, a random-effects model was used, and sources of the heterogeneity were further examined through subgroup analyses. As mean differences in OSA 18 and PedsQl scales mean difference are continuous Variables, the improvement of quality of life will be expressed by mean difference (MD). A 95% confidence interval (CI) is used to express all interval estimates. When the P value < .05, it indicates statistical significance. The data of the mean differences effects is demonstrated in Forest plot diagrams.

Basic characteristics of included studies: Baseline characteristics of all included studies are detailed in the included article characteristics table (Table 1). one article was conducted in Sweden [9], while the remaining studies were from the USA [4,10,11]. All four articles are RCTs. Children's Ages ranged from 2 up to 12.9 years, with sample sizes of about 60 - 259 patients. Most studies (n = 3) used the OSA 18 Scale as the primary assessment tool for quality-of-life assessment. In contrast, one study reported Qol as a primary outcome [11]. However, most of the studies utilized alternative criteria for assessing quality of life as a secondary outcome, other outcomes such as cognitive and behavioral improvement after the surgery. All four studies have follow-up periods ranging from 6 to 12 months. Statistical analysis. The results from the included studies highlight the positive effects of treatment on quality of life, as measured by different validated scales (OSA 18, PedsQl). Overall, these findings (Figure 2,3) suggest that treatment for OSA leads to meaningful improvements in quality of life, though differences in study populations or methodologies may contribute to variability in some outcomes. However, cognitive and executive improvement was nonsignificant according to the values of the (BREIF) Scale (Figure 4). The evidence shows that early adenotonsillectomy (eAT) is much better than watchful waiting with supportive care (WWSC), in terms of OSA-18 score change, as shown by a pooled mean difference of -14.16 [-25.40, -2.93] ($P < 0.00001$). The effects of all three studies reported lay between -9.80 and -18.50 in favor of eAT, and none crossed zero, showing statistical significance. However, heterogeneity was observed ($I^2 = 79\%$), indicating differences between the studies in (Figure 2). The findings indicate that early adenotonsillectomy (eAT) significantly enhances PedsQL scores compared to watchful waiting with supportive care (WWSC), with a pooled mean difference of 4.92 [3.37, 6.47] while ($P < 0.00001$). All the studies had positive mean differences of 4.70 to 5.00, all of which were statistically significant. Notably, heterogeneity was extremely low ($I^2 = 0\%$), reflecting consistency between studies (Figure 3). These results strongly support eAT as a powerful intervention for enhancing pediatric quality of life. The findings in (Figure 4) indicate that early adenotonsillectomy (eAT) is not associated with a statistically significant benefit on caregiver-reported cognitive and executive functions, as measured by the BRIEF scale (pooled mean difference is : -2.44 [-18.32, 13.44] while $P = 0.05$). Significant heterogeneity ($I^2 = 77\%$) reveals significant between-study variation. These findings indicate that eAT may not have a significant or uniform impact on cognitive and executive functions, and further studies are required. Quality assessment and bias risk. Regarding the assessment of quality of life (QoL) outcomes using the Risk of Bias 2 (ROB2) tool, the included studies revealed varying degrees of bias across various domains. The majority of the studies demonstrated a “low risk” of bias in the randomization process, ensuring adequate allocation of participants. In a few trials, bias related to deviations from the intended intervention was observed, particularly in those with inadequate blinding or excessive dropouts (Figure 5).

Discussion

This review highlights key findings and provides valuable insights into the comparative effectiveness of adenotonsillectomy (AT) versus watchful waiting with supportive care in improving quality of life (QoL) in pediatric patients with obstructive sleep apnea (OSA). Out of 707 articles gathered from various databases, four randomized controlled trials (RCTs) with a total of 1,436 participants were included. The analysis was conducted for each scale separately: OSA-18, PedsQL, and BRIEF. Results in early AT (within one year) values showed significant improvement in QoL parameters, including sleep-related symptoms, daytime functioning, and overall health outcomes, compared with conservative management. Adenotonsillectomy demonstrated superior efficacy in lowering the apnea–hypopnea index (AHI), enhancing oxygen saturation, and alleviating symptoms such as excessive daytime sleepiness. On the other hand, there was no significant improvement in cognition and executive functions. the study by Johan Fehrm et al. [9], adenotonsillectomy significantly improved quality of life compared to watchful waiting in children with mild to moderate obstructive sleep apnea (OSA), These improvements are likely attributed to the removal of anatomical obstructions, leading to enhanced airway patency and better sleep quality. While the reduction in apnea-hypopnea index (OAHI) was small. other studies reported that adenotonsillectomy improved quality of life, reducing sleep problems and daytime sleepiness, while also enhancing physical and emotional well-being. However, it did not significantly improve cognitive function, such as attention or executive skills. The benefits were mainly in symptom relief rather than mental performance, what was reported by Susan Redline et al [10]. Similarly, Susan L. Garetz et al. [11] found that AT improved QoL, reduced sleep problems and daytime sleepiness, and enhanced physical and emotional well-being but did not significantly improve cognitive function, such as attention or executive skills. These three articles [9,10,11] were estimating Qol according to (OSA 18) scale. In the study by Carole L. Marcus et al. [4], which used only the PedsQL scale for QoL assessment, children who underwent early AT experienced better QoL, improved behavior, and enhanced sleep outcomes compared with those in the watchful waiting group. However, the procedure did not lead to notable cognitive improvements. Each study represents consistent values of improvement in QoL scores on the OSA-18 and/or PedsQL scales, with no significant gains in cognitive, executive, or behavioral functions.

Our findings largely align with previous systematic reviews and randomized controlled trials (RCTs) while also offering novel insights into treatment effects across different patient subgroups. In a systematic review published by Nguyen B et al. [12] reported that surgery reduced symptoms of OSA and improved behavior and QoL but did not show significant improvements in the domains of attention or executive function after adenotonsillectomy

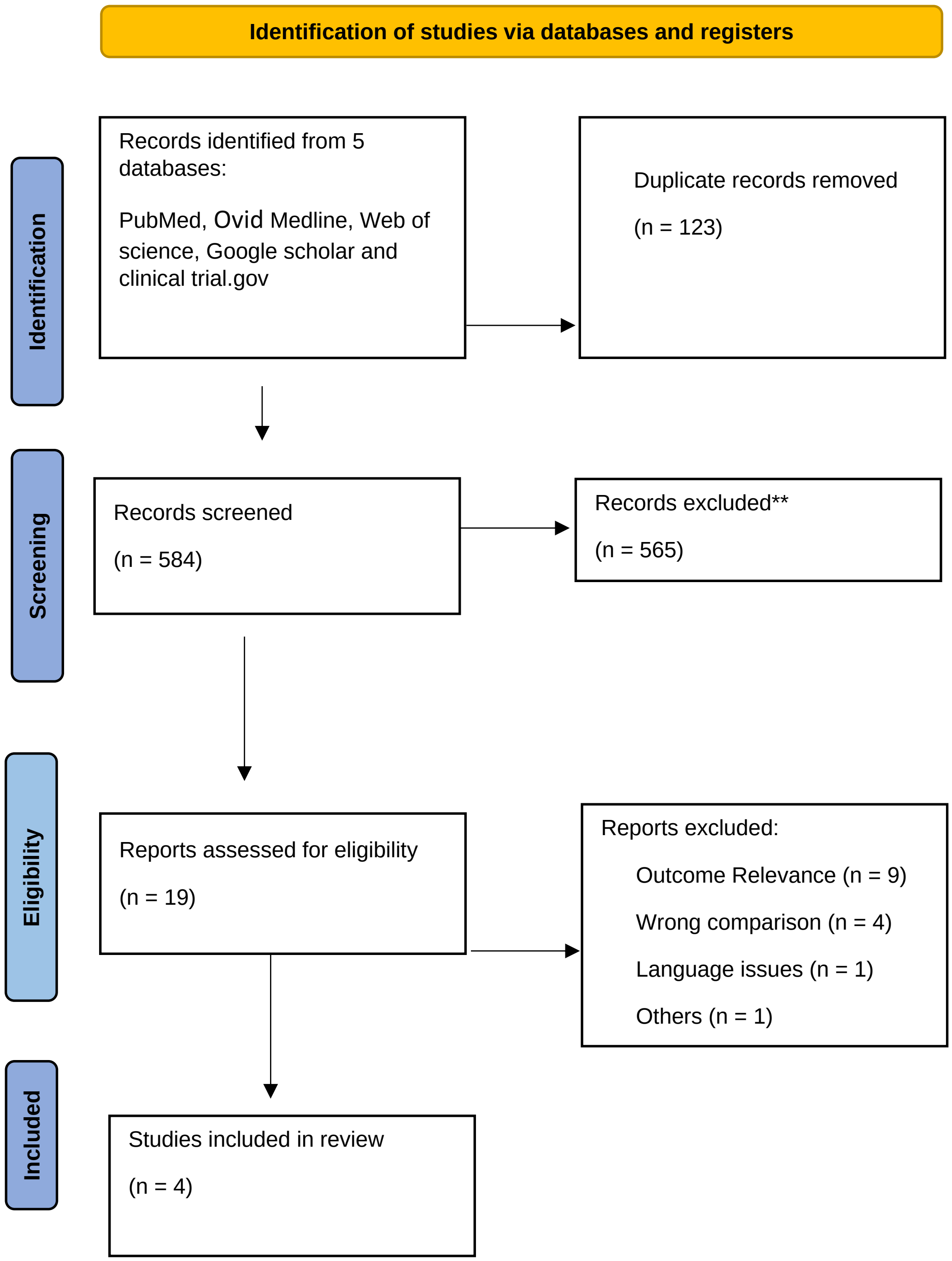


Figure 1:PRISMA flow diagram.

Table 1: Basic characteristics of included articles.

Study & Origin	Age Range	Sample Size	Primary Outcomes	Assessment Tools	Follow up after surgery	Key Findings
Fehrm et al. (Sweden) [9]	2–4 years	60	Change in obstructive apnea–hypopnea index (OAHI)	• OSA-18• VAS QoL	6 months	ATE improved QoL significantly; small difference in OAHI.
Redline et al. (USA) [10]	3–12.9 years	459	BRIEF Global Executive Composite (GEC) T-score; Go/No-Go d-prime	• OSA-18• PedsQL• PSQ-SRBD• mESS• BRIEF• Go/No-Go (GNG) Test	12 months	Better QoL, behavior, and blood pressure in ATE group. No significant cognitive improvement.
Marcus et al. (USA) [4]	5–9 years	464	NEPSY attention/executive function composite score	• OSA-18• PedsQL• PSQ-SRBD• mESS• NEPSY• BRIEF	7 months	No significant cognitive benefit; improved behavior, QoL, and sleep parameters in ATE group.
Garetz et al. (USA) [11]	5–9.9 years	453	Changes in QoL and symptom severity	• OSA-18• PedsQL• PSQ-SRBD• mESS	7 months	ATE significantly improved QoL and symptoms.

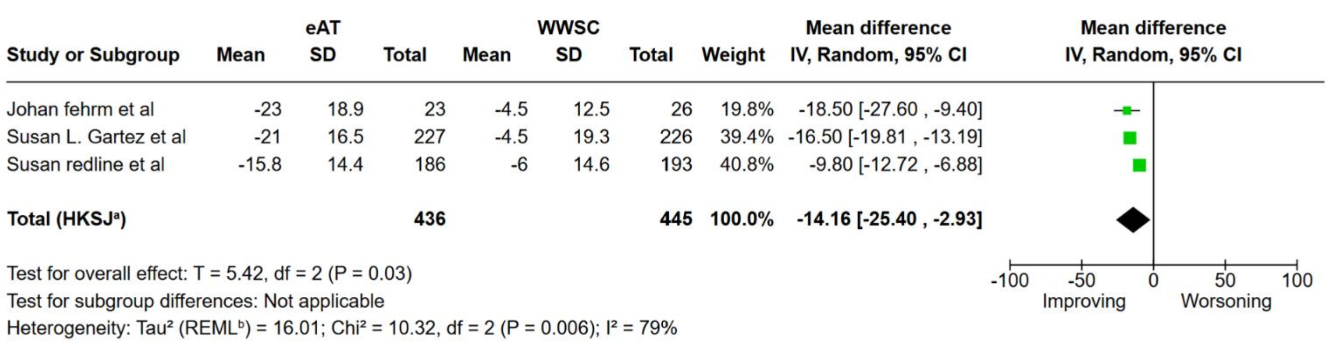
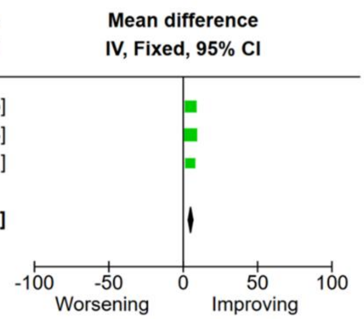


Figure 2:pooled mean effect of quality-of-life using values of (OSA 18) Scale.

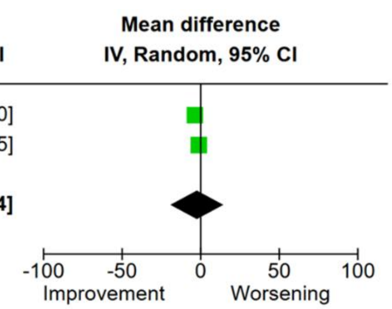
	eAT			WWSC				Mean difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Fixed, 95% CI**
Carole L. Marcus et al	5.9	13.6	194	0.9	13.3	203	34.3%	5.00 [2.35 , 7.65]
Susan L. Garetz et al	5.9	13.6	227	0.9	13.3	226	39.1%	5.00 [2.52 , 7.48]
Susan Redline et al	2.1	14.9	187	-2.6	15	193	26.6%	4.70 [1.69 , 7.71]
Total			**608**			**622**	**100.0%**	**4.92 [3.37 , 6.47]**



Test for overall effect: Z = 6.22 (P < 0.00001)
Test for subgroup differences: Not applicable
Heterogeneity: Chi^2 = 0.03, df = 2 (P = 0.99); I^2 = 0%

Figure 3:pooled mean effect of quality of life using values of (PedsQl) Scale.

	eAT			WWSC				Mean difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**
Carole L. Marcus et al	-3.3	8.5	194	0.4	8.8	203	49.6%	-3.70 [-5.40 , -2.00]
Susan Redline et al	-3.1	9.4	231	-1.9	8.6	227	50.4%	-1.20 [-2.85 , 0.45]
Total (HKSJ[a])			**425**			**430**	**100.0%**	**-2.44 [-18.32 , 13.44]**



Test for overall effect: Z = 1.95 (P = 0.05)
Test for subgroup differences: Not applicable
Heterogeneity: Tau^2 (REML[b]) = 2.39; Chi^2 = 4.27, df = 1 (P = 0.04); I^2 = 77%

Figure 4: pooled mean effect of cognitive and executive functions using values of (BRIEF) Scale.

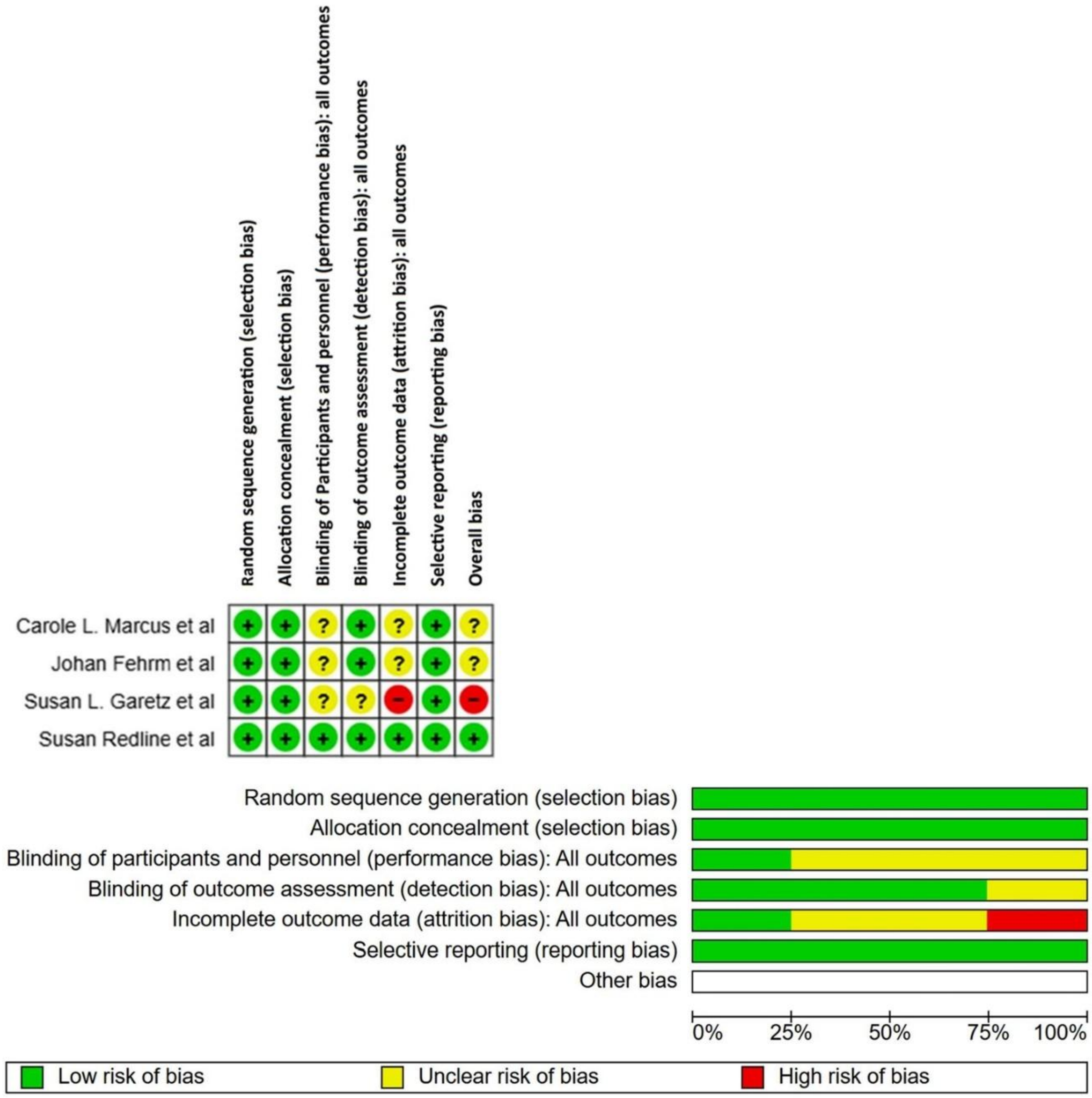


Figure 5: Risk of Bias assessment.

compared to watchful waiting. its impact on cognition and behavior remains uncertain, particularly in children with mild OSAS. Another study by Alexios Tsikopoulos et al. [13] indicated that AT enhances QoL in children with OSA but does not show significant effects on cognitive or behavioral outcomes. It similarly found QoL benefits without clear cognitive improvements. The findings suggest that while AT is effective in enhancing QoL, its impact on cognition and behavior remains uncertain, particularly in children with mild OSA. The reviews [12,13] closely align with our findings regarding QoL, behavioral, and cognitive functions.

Strengths and limitations: This systematic review and meta-analysis is notable for their rigorous methodology, conducted in accordance with PRISMA criteria. It has well-defined inclusion and exclusion criteria, so only high-quality RCT studies are included. The methodology was also registered with PROSPERO, which increased its transparency and dependability to ensure consistent and clinically meaningful outcomes across studies. Another strength is its comprehensive analysis of treatment outcomes. Secondary outcomes such as cognition and behavioral improvements, adverse events, and sleep parameters like oxygen saturation and AHI. These results offer useful information to support clinical judgments on the optimal management of pediatric OSA. There are a few limitations we have, one is that Variable QoL assessment instruments were used. Although the review concentrates on proven tools like the (PedsQL) and the (OSA-18) questionnaire, not all research employed the same instruments. This variation could limit the capacity to make firm conclusions on the degree of QoL improvements after adenotonsillectomy versus supportive treatments and compromise the comparability of results. Another limitation is in the variation in follow-up periods between the studies included. While some studies measured QoL improvements within six months of treatment [9], others had follow-up periods of about seven months [4,11] or approximately one year [10]. These differences make it difficult to determine the short-term sustainability of the benefits of adenotonsillectomy compared with supportive treatments, as some improvements may be temporary while others may become more pronounced over time. Our research provided helpful insights, showing significant improvements in quality of life after a one-year period. However, further research is needed to address existing gaps and strengthen the evidence for the treatment of pediatric OSA patients. A significant subject for future research is the need for long-term randomized controlled trials (RCTs). Extended follow-up periods are required to evaluate whether QoL, sleep parameters, and behavioral improvements remain stable over time. Furthermore, assessing the cost-effectiveness of AT compared with supportive care. Despite its widespread use, AT carries risks associated with surgery and medical costs. To inform treatment choices and guarantee cost-effective management options for pediatric OSA, future research should assess the direct and indirect costs of each strategy.

Conclusion

This systematic review confirms that adenotonsillectomy (AT) significantly improves the quality of life in pediatric patients with obstructive sleep apnea (OSA) compared with watchful waiting and supportive care. AT markedly reduces symptom severity, enhances sleep-related outcomes, and increases overall well-being, as reflected by improvements in OSA-18 and PedsQL scores. However, no significant improvements were observed in cognitive or executive functions, as measured by the PRIEF scale. Although AT remains an effective treatment for pediatric OSA, surgical decisions should be individualized, considering potential complications and the natural disease course. Further long-term studies are warranted to confirm the durability of quality-of-life benefits and to better compare surgical and conservative management strategies.

Conflict of Interest

None

Funding

None

References

1. Gouthro K, Slowik JM. Pediatric Obstructive Sleep Apnea. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025;11:32491542.

2. Vaienti B, Di Blasio M, Arcidiacono L, Santagostini A, Di Blasio A, Segù M. A narrative review on obstructive sleep apnoea syndrome in paediatric population. Front Neurol. 2024;15:1393272. doi:10.3389/fneur.2024.1393272.

3. Mussi N, Forestiero R, Zambelli G, Rossi L, Caramia MR, Fainardi V, et al. The first-line approach in children with obstructive sleep apnea syndrome (OSA). J Clin Med. 2023;12(22):7092. doi:10.3390/jcm12227092.

4. Marcus CL, Moore RH, Rosen CL, Giordani B, Garetz SL, Taylor HG, et al. A randomized trial of adenotonsillectomy for childhood sleep apnea. N Engl J Med. 2013;368(25):2366–76. doi:10.1056/NEJMoa1215881.
5. Tapia IE, Shults J, Cielo CM, Kelly AB, Elden LM, Spergel JM, et al. A trial of intranasal corticosteroids to treat childhood OSA syndrome. Chest. 2022;162(4):899–919. doi:10.1016/j.chest.2022.06.026.
6. Bacon BR, Hassinger AB, Varavenkataraman G, Gould E, Sahlollbey N, Carr MM. Comparison of Epworth Sleepiness Scale and OSA-18 scores with polysomnography in children. Otolaryngol Head Neck Surg. 2024;171(1):239–46. doi:10.1002/ohn.683.
7. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JPA, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. J Clin Epidemiol. 2009;62(10):e1–34. doi:10.1016/j.jclinepi.2009.06.006.
8. Sterne JAC, Savović J, Page MJ, Elbers RG, Blencowe NS, Boutron I, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ. 2019;366:l4898. doi:10.1136/bmj.l4898.
9. Fehrm J, Nerfeldt P, Browaldh N, Friberg D. Effectiveness of adenotonsillectomy vs watchful waiting in young children with mild to moderate obstructive sleep apnea. JAMA Otolaryngol Head Neck Surg. 2020;146(7):647–54. doi:10.1001/jamaoto.2020.0635.
10. Redline S, Cook K, Chervin RD, Ishman S, Baldassari CM, Mitchell RB, et al. Adenotonsillectomy for snoring and mild sleep apnea in children. JAMA. 2023;330(21):2084–93. doi:10.1001/jama.2023.20288.
11. Garetz SL, Mitchell RB, Parker PD, Moore RH, Rosen CL, Giordani B, et al. Quality of life and obstructive sleep apnea symptoms after pediatric adenotonsillectomy. Pediatrics. 2015;135(2):e477–86. doi:10.1542/peds.2014-0620.
12. Nguyen BK, Quraishi HA. Tonsillectomy and adenoidectomy. Pediatr Clin North Am. 2022;69(2):247–59. doi:10.1016/j.pcl.2021.12.008.
13. Tsikopoulos A, Tsikopoulos K, Dilmperis F, Anastasiadou S, Garefis K, Fountarlis A, et al. Adenotonsillectomy versus watchful waiting for children with obstructive sleep apnea syndrome: a systematic review with meta-analysis. Indian J Otolaryngol Head Neck Surg. 2024;76(5):4910–22. doi:10.1007/s12070-024-04169-5.